

NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

**FACTORS THAT AFFECT SUCCESS IN IMPLEMENTING
ACTIVITY BASED COST MANAGEMENT IN A
GOVERNMENT ORGANIZATION: A COMPARATIVE
CASE STUDY ANALYSIS**

by

Scott W. Gray

June 2000

Thesis Co-Advisors:

Kenneth J. Euske
Susan P. Hocevar

Approved for public release; distribution is unlimited.

20000720 030

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 2000		3. REPORT TYPE AND DATES COVERED Master's Thesis
4. TITLE AND SUBTITLE : Factors That Affect Success in Implementing Activity Based Cost Management in a Government Organization: A Comparative Case Study Analysis			5. FUNDING NUMBERS	
6. AUTHOR(S) Scott W. Gray				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
ABSTRACT (maximum 200 words) In an era when the American public is focused on government financial accountability, leaders within the federal government are seeking ways to understand their costs. In December 1999, the Department of the Navy released its strategic plan to understand and manage the Total Ownership Costs of its assets and services. The plan gives local commanders the authority to choose which cost management tools to use, while strongly encouraging them to use Activity Based Cost Management (ABCM). To assist Navy commanders in their decisions, this research examines the factors affecting ABCM implementation in five divisions of one government bureau. The study categorizes the factors into behavioral, organizational, technical implementation, and work technology aids and hindrances. Relationships between a factor's presence in a division and its success in implementing ABCM indicate the factor's relevance. Technical implementation factors do not appear as relevant as factors related to behavior and work technology in driving ABCM implementations toward success or failure. However, among the factors identified, behavioral aids, such as an atmosphere of trust and cooperation; organizational aids, such as using ABCM as a tool to support innovation; and work technology aids, such as routine work processes, appear to drive ABCM toward success.				
14. SUBJECT TERMS Cost Management, Cost Measurement, Activity Based Cost Management, Implementation, Success Factors, ABCM, ABC, ABM			15. NUMBER OF PAGES 92	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

**FACTORS THAT AFFECT SUCCESS IN IMPLEMENTING ACTIVITY BASED
COST MANAGEMENT IN A GOVERNMENT ORGANIZATION:
A COMPARATIVE CASE STUDY ANALYSIS**

Scott W. Gray
Lieutenant, United States Navy
B.S., United States Naval Academy, 1994


Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

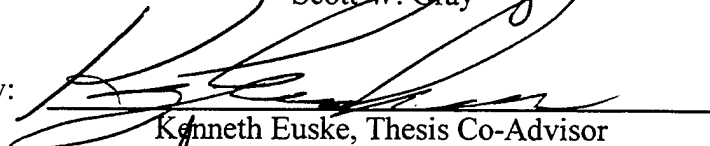
from the

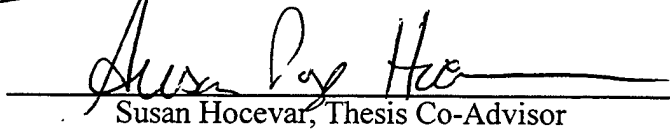
**NAVAL POSTGRADUATE SCHOOL
June 2000**

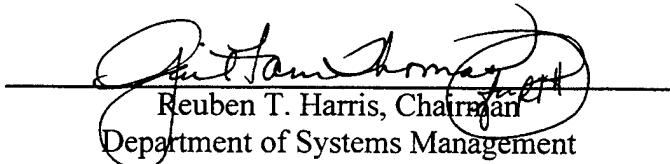
Author:


Scott W. Gray

Approved by:


Kenneth Euske, Thesis Co-Advisor


Susan Hocevar, Thesis Co-Advisor


Reuben T. Harris, Chairman
Department of Systems Management

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

In an era when the American public is focused on government financial accountability, leaders within the federal government are seeking ways to understand their costs. In December 1999, the Department of the Navy released its strategic plan to understand and manage the Total Ownership Costs of its assets and services. The plan gives local commanders the authority to choose which cost management tools to use, while strongly encouraging them to use Activity Based Cost Management (ABCM). To assist Navy commanders in their decisions, this research examines the factors affecting ABCM implementation in five divisions of one government bureau. The study categorizes the factors into behavioral, organizational, technical implementation, and work technology aids and hindrances. Relationships between a factor's presence in a division and its success in implementing ABCM indicate the factor's relevance. Technical implementation factors do not appear as relevant as factors related to behavior and work technology in driving ABCM implementations toward success or failure. However, among the factors identified, behavioral aids, such as an atmosphere of trust and cooperation; organizational aids, such as using ABCM as a tool to support innovation; and work technology aids, such as routine work processes, appear to drive ABCM toward success.

THIS PAGE INTENTIONALLY LEFT BLANK.

TABLE OF CONTENTS

I. INTRODUCTION	1
A. BACKGROUND	1
B. PURPOSE	5
C. RESEARCH QUESTIONS	5
D. METHOD	5
E. SCOPE AND LIMITATIONS	7
1. Scope of Thesis	7
2. Limitations of Thesis	7
II. LITERATURE REVIEW AND BACKGROUND	9
A. ACTIVITY BASED COST MANAGEMENT DEFINED	9
1. ABC Defined	9
2. ABM Defined	11
B. HISTORY OF ACTIVITY BASED COST MANAGEMENT	11
C. ACTIVITY BASED COST MANAGEMENT RESEARCH EMPHASIS	13
D. DETERMINATION OF SUCCESSFUL IMPLEMENTATION	17
E. RESEARCH MODEL	18
III. RESEARCH METHOD	23
A. RESEARCH SETTING	23
B. METHOD AND DATA COLLECTION	24
IV. RESEARCH DATA AND ANALYSIS	27
A. IMPLEMENTATION BACKGROUND	27
B. CURRENT STATUS OF ABCM IMPLEMENTATION	28
1. Personnel Division	29
2. Administration Division	30

3. Information Systems Division	30
4. Financial Management Division	30
5. Audit Division.....	31
C. RELATIVE SUCCESS	31
D. DISCUSSION AND ANALYSIS	32
1. Personnel Division	32
2. Administration Division.....	36
3. Information Systems Division	38
4. Financial Management Division	40
5. Audit Division.....	41
E. IDENTIFICATION OF FACTORS AFFECTING IMPLEMENTATION	44
1. Factors That Aided ABCM Implementation.....	44
2. Factors That Hindered ABCM Implementation.....	44
F. ANALYSIS OF IDENTIFIED FACTORS.....	45
V. CONCLUSIONS, DISCUSSION OF FINDINGS, AND RECOMMENDATIONS	55
A. CONCLUSIONS	55
1. Work Technology Factors.....	55
2. Behavioral Factors	57
3. Organizational Factors	58
4. Technical Implementation Factors.....	60
5. Additional Benefits Observed	60
B. RECOMMENDATIONS FOR DOD.....	61
C. RECOMMENDATIONS FOR FURTHER RESEARCH	63
APPENDIX A. THE CAM-I CROSS.....	67
APPENDIX B. STEPS TO CREATE AN ABM MODEL.....	69
APPENDIX C. HIGH LEVEL PROJECT PLAN	71
APPENDIX D. BUREAU ORGANIZATION CHART	73
LIST OF REFERENCES.....	75
INITIAL DISTRIBUTION LIST	79

LIST OF FIGURES

1. Comprehensive ABCM implementation model.....	19
2. ABCM implementation progress relative to the implementation model	33
3. ABCM implementation factors identified	46
4. Aids and hindrances sorted by category, prevalence, and dispersion.....	47
5. Relationship of aids and hindrances by category.....	52
6. ABCM implementation assessment chart.....	62

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENT

The author would like to acknowledge those individuals who provided their support and candid responses throughout the information-gathering phase of this thesis.

The author would like to thank Professor Euske, Assistant Professor Hocesvar, Captain (ret.) John Mutty, and Professors Fremgen and McCaffery for their guidance, criticism, and support in bringing this research to fruition.

In addition, the author wishes to acknowledge the assistance of Mr. Mike Roberts and Miss Laura Zander of MEVATEC Corporation in this effort.

Finally, the author desires to express his gratitude to those at Naval Air Warfare Center, Aircraft Division who funded this project.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

A. BACKGROUND

Activity Based Costing (ABC) is based on the idea that doing activities is what costs organizations money; so measuring the costs of performing those activities is a sensible approach to figuring out where the money goes. Brimson and Antos (1999) describe Activity Based Costing (ABC) as “determining the cost of cost objects with activities and business processes. Activities consume costs and cost objectives consume activities and business processes” (p. 263).

Timothy White of Chrysler Corporation describes ABC as “the measurement tool for the total management of the production cycle activities” (White, 1997, p. 23). The word “tool” is the vital part of his definition. Like any measuring tool, its purpose is to measure. What people do with the measured results gives the tool its value.

Activity Based Management (ABM) is a use for the tool. Brimson and Antos (1999) define ABM as

Structuring an organization's activities and business processes to meet customer and external needs with the least resources to produce a consistent output. ABM is planning and control of an organization through its activities and business processes (p. 263).

This points directly at its use in getting the most efficient use of resources, but it achieves it through the lens of meeting customer and stakeholder needs.

White (1997) defines ABM as “a decision making process that directly affects and alters the amount of activity, and subsequently the consumption of economic resources, required in the performance of a specific process” (p. 23). White's definition brings out

the point that ABM is about making substantive decisions to change the cost-creating activities people actually do.

Activity Based Cost Management is simply a term used to describe the combination of ABC and ABM. The origination of the combined term is unclear, but Cooper, et al. (1992) refer to the combination in the title of their book *Implementing Activity Based Cost Management: Moving from Analysis to Action*.

Why is any of this pertinent to the Department of Defense? Steve Player of Arthur Andersen and Carol Cobble of Armstrong Laing provide one answer to this question after studying the British Navy's ABM implementation:

Because of budget cutbacks, military leaders throughout the world have had to face the important question of how cost management can help military commanders meet their goals – defending their countries in a time of lessened tension – while also keeping military men and women ready for war. (Player and Cobble, 1999, p. 105)

In the United States Department of the Navy (DoN), leaders face this same challenge amidst ever increasing commitments and the American public's desire to reap the benefits of a "peace dividend." As the costs of the Reagan buildup of the 1980's started to consume funding and the planned savings from cuts never materialized, lawmakers began to feel the need to assuage the rapid increase in the government's sea of red ink. This prompted a variety of legislative and executive actions geared to focus the federal government on results and eliminate processes that existed for their own sakes. (GAO, 1996)

In 1990, Congress enacted the Chief Financial Officers Act to cause the federal government to indicate to United States taxpayers what their taxes are funding. To accomplish this, it established the requirement for federal government organizations to

provide financial statements. The scope of such a requirement caused government controllers to learn ways to understand the costs their organizations generated. (Congress, 1990) In an effort to find ways to better measure the costs of government services, government leaders looked at the private sector to glean best practices in cost measurement and management (e.g., benchmarking, total ownership cost management, ABCM). (Kehoe, et al., 1995)

In 1993, Congress and the President emphasized the challenge to do more with less by establishing the Government Performance and Results Act of 1993 (GPRA) and the National Performance Review (NPR), respectively. GPRA requires that all federal government organizations of the United States develop top-level strategic plans and evaluate their implementation based on the results devised from the top and sent down. The President created NPR, now the National Partnership for Reinventing Government, to “. . . create a government that works better and costs less. . . .” NPR’s focus was to develop bottom-up solutions to the problems of red tape in government and work towards greater efficiency and effectiveness. (GAO, 1996; Arnold, 1995; GPRA, 1993)

Without understanding what activities drive their costs, government leaders cannot effectively eliminate or refine those activities that do not add value. ABCM is one of the business practices NPR sought to foster in government attempts to understand and manage costs. (Wood, 1996)

In keeping with both GPRA and NPR, in December 1999, the Office of the Secretary of the Navy released the DoN Activity Based Cost Management Strategic Implementation Plan. This plan was contained in a memorandum to the Under Secretary

of Defense (Acquisition, Technology, and Logistics), dated December 8, 1999, in which Under Secretary of the Navy Hultin wrote:

It is DoN policy to understand total ownership costs (TOC) and to manage costs aggressively using the most appropriate and effective tools available. ABCM is strongly encouraged as a tool to understand and manage TOC. (Hultin, 1999)

Due to the complexity of ABCM implementation in an organization so large, and because its effectiveness depends on individual leaders, the DoN's policy is that each manager will decide on the appropriate pace and path of implementation, if any. The function of providing an overarching strategy for ABCM implementation is to enable local DoN leadership to successfully implement ABCM by providing information, guidance, tools, metrics, and lessons learned. (Hultin, 1999)

For local DoN commanders to implement ABCM successfully, they must understand its purpose, the challenges they will face, and the factors that facilitate ABCM implementation in government organizations. Examples of ABCM implementations in government organizations could be helpful to those DoN commanders. Unfortunately, however, detailed information about government organizations that have successfully implemented ABCM is scarce. Research revealed few published field studies of successful ABCM implementation in government (e.g., Player and Cobble, 1999; Brimson and Antos, 1994). For this reason, the author has investigated a United States government organization identified as having successfully implemented ABCM. That organization is the focus of this research.

The organization, termed "the Bureau" for this research, desires not to be named; however, the Bureau, funded primarily through appropriations, consists predominantly of

government employees and has offices in several states, with a central office in Washington, D.C.

B. PURPOSE

The purpose of this research is to determine what factors contributed to varying degrees of success among the divisions of the Bureau in implementing ABCM. The author's analysis of the results provides DoN leaders information to assist them in deciding the proper scope of ABCM implementation, if any, for which to strive in their own commands.

C. RESEARCH QUESTIONS

The primary research question was, "What are the factors that lead to varying degrees of success in implementing ABCM in a government organization?"

Secondary research questions were:

- What are the measures, criteria, and indicators of successful implementation of ABCM?
- What are the factors that facilitated successful ABCM implementation?
- What are the factors that hindered successful ABCM implementation?
- What factors have made one division of the organization more successful than the others in implementing ABCM?
- Which facilitating factors lead to success and which hindering factors lead to failure in ABCM implementation?
- In the aggregate, what impact has the implementation of ABCM had on the organization?

D. METHOD

The method used in this thesis research is consistent with case study research and included the following: (1) a literature search of books, magazine articles, web sites, and

other library information resources; (2) interviews with personnel within the organization in question; (3) identifying differences in the culture and structure of its divisions through analysis of interview data and review of records; (4) identifying aids and hindrances to organizational change within each division through analysis of interview data; (5) determining the factors most influential to each division's relative level of success in effecting the change to ABCM through analysis of interview data; (6) identifying by deduction those factors that apply throughout government organizations, in general; and (7) determining recommended strategies for increasing success in implementing ABCM.

The part of the Bureau that participated in this study is composed of five distinct divisions, which permitted the author to use comparative case study design. Each division was treated as a separate entity to be analyzed and compared with the other entities. The researcher visited the main offices of each of the five divisions to determine what factors made one division more successful than the others in implementing ABCM. At each site, the author conducted interviews with employees involved in the ABCM implementation to serve as the primary source of qualitative data to be used in comparisons among divisions. The researcher also collected archival documentation for analysis including (1) models developed by the divisions to implement ABCM and (2) background information on the Bureau and the divisions.

The author combined qualitative analysis of the knowledge gained from the field study with the results of the literature review to determine how the various factors that affected ABCM implementation in the researched organization can be applied to DoN commands in their implementation of ABCM.

E. SCOPE AND LIMITATIONS

1. Scope of Thesis

The thesis includes (1) a summary description of ABCM, (2) comparison of the researched organization's implementation to pre-defined standards for success, (3) identification of factors that aided and hindered ABCM implementation in each division of the organization, and (4) discussion of how those factors can contribute to successful ABCM implementation in other government organizations.

2. Limitations of Thesis

As a case study, the findings and conclusions supported by the research may prove to be specific to the Bureau studied, limiting the ability to generalize the research findings for other organizations. Since the Bureau is funded through congressional appropriations, consists primarily of government employees, and operates from a zero-based budget, the author believes challenges to the relevance of generalizations in this research to other government agencies and departments are mitigated.

Although applicability of ABCM is independent of an organization's size, other factors than those presented in this research might arise in organizations significantly larger than the 600-person organization that is the subject of this research.

Only one directorate within one bureau was studied, which limits the thesis in that the effect of different directors on the implementation of ABCM was not analyzed. The director acted as champion of the ABCM process, which is analogous to a DoN commander acting as champion for the implementation of ABCM within his or her organization. Since the commander is the intended end user for this research, the author believes comparing the five divisions within only one directorate does not detract from the value of the thesis to the end user.

THIS PAGE INTENTIONALLY LEFT BLANK

II. LITERATURE REVIEW AND BACKGROUND

A. ACTIVITY BASED COST MANAGEMENT DEFINED

1. ABC Defined

In their book, *Implementing Activity-Based Cost Management: Moving from Analysis to Action*, Cooper, et al. (1992) describe Activity Based Cost Management (ABCM) as the union of Activity Based Costing (ABC) and Activity Based Management (ABM). They state:

Activity-based cost management is more than a system. It is a management process. Managers at each company [included in the study] understood that the ABC information enabled them to manage activities and business processes by providing a cross-functional, integrated view of the firm. (Cooper, et al. p. 1)

To explain ABCM's two major components, Player and Cobble (1999) define ABC as "a methodology that measures the cost and performance of activities, resources, and cost objects" (p. 247). A cost object is any unit for which one desires a separate measure of cost (i.e., customer, product, service, project, or some other work unit). The ABC component simply provides information.

To understand ABC, it is important for the reader to understand how it differs from traditional cost systems and under what circumstances using ABC is advantageous. Cooper, et al. (1992) explain that ABC differs from traditional cost systems by pooling costs in activities instead of cost centers and by assigning those pooled costs to outputs based on cost drivers that are structurally different from traditional cost allocation bases.

They state:

These modifications . . . allow well-designed, activity-based cost systems to report more accurate costs than a traditional system because they identify clearly the costs of the different activities being performed in the organization, and they assign the costs of these activities to outputs using

measures that represent the types of demands that individual outputs make on those activities. With more accurate output costs, managers can make better decisions about their outputs and the activities that produce these outputs. (Cooper, et al., p. 11)

The authors continue, stating that ABC measures activity costs more accurately than traditional cost systems when the levels of activity in the ABC cost pools are significantly larger or smaller in proportion to output volume. (Cooper, et al., 1992)

Traditional cost systems are not, however, inherently flawed. They were developed at a time when organizations typically produced one product. For such organizations, traditional cost systems can be expected to provide appropriate information for decision-making. As some organizations began to change their processes, however, to manufacture multiple products, the costing systems did not change to reflect the new reality. A lack of enabling technology (e.g., ABCM implementation software) also may have prevented costing based on activities from developing. Whatever the cause, the traditional functional approach, by and large, remained the standard for companies that created multiple products. (Player and Cobble, 1999)

The problem traditional approaches present where there is more than one product (or service) is that any allocation of indirect overhead costs becomes arbitrary. ABC does not eliminate all arbitrary allocation of overhead, but it significantly reduces it. Here is an example to illustrate how ABC systems eliminate the distortions traditional cost systems create in multi-service organizations.

Imagine a pier that supported only one type of ship, aircraft carriers. The shore power provider charges ships based on the time they spend at the pier. That is, the rate is calculated by dividing the total cost of power provided by the total number of hours ships were moored at the pier. Assume that over time the pier was fitted with shore power

connections for a variety of ship types. Currently, on one side of the pier is an aircraft carrier, and on the other, a patrol craft. The aircraft carrier will be undercharged and the patrol craft will be overcharged. This simple example demonstrates the distortion that can occur with traditional costs systems.

In multi-product or multi-service organizations, traditional cost systems hide the distortions, which become apparent when people start assigning activity costs to outputs. Eliminating the distortion through implementing the ABC tool becomes useful when managers can apply the cost information to improve or eliminate activities.

2. ABM Defined

The more accurate information provided by ABC becomes useful when managers actually use the ABC data to make decisions and to conduct ABM. That is, they make changes in processes, eliminate activities, or simply gain knowledge of costs to support their proposed actions. Player and Cobble define ABM as “a management information system that uses activity-based information to facilitate decision making across the organization” (p. 6). Kehoe, et al. (1995) define ABM as “business management in which process owners have the responsibility and authority to control and improve operations, and that uses ABC methods” (p. 273). People can relate to it and often remark that it is common sense. (Cokins, et al., 1992)

B. HISTORY OF ACTIVITY BASED COST MANAGEMENT

Contrary to the beliefs of some managers today, activity-based concepts are not a new development of the last 15 years. As early as 1903, Frederick Taylor proposed that jobs should be broken down into tasks with specified times through which costs of those jobs could be determined and minimized. (Player and Cobble, 1999)

H.L. Gantt, who had worked directly for Taylor, devised the "Gantt Chart" in 1917, showing timelines based on completion of activities. In the 1920's, the Gilbreths refined the concepts behind time-motion studies. Management abuses and the subsequent distrust of management by employees and labor unions prevented the positive effects of the Gilbreths' work from coming to fruition. (*ibid.*)

In 1954, Peter Drucker's *The Practice of Management* firmly set the stage for activity-based approaches to management. Drucker wrote:

To find out what activities are needed to obtain the objectives of the business is such an obvious thing to do that it would hardly seem to deserve special mention. But analyzing the activities is as good as unknown to traditional theory. Questions can only be answered by analyzing the activities that are needed to attain objectives. (Drucker, 1954)

For the two decades to follow, activity-based measurement approaches were implemented in fits and starts. Player and Cobble state, "While multitudes of [activity-based] efforts have occurred, none proved successful for long. This was primarily due to a lack of enabling technology" (p. 18). This soon changed, however.

In, 1972, Computer Aided Manufacturing-International (CAM-I) was founded to create protocols that would permit various manufacturers' computers to communicate. In the mid-1980's, heightened pressure from global competitors forced United States manufacturers to focus their attention on cutting costs and shortening products' time-to-market. Manufacturers in the CAM-I group voiced their concerns that traditional cost systems hampered their ability to compete because the cost systems "did a poor job of helping management understand profitability by product and customer, evaluate capital investments, and find better ways to manage rising overhead costs" (Player and Cobble, 1999, p. 24).

In 1985, CAM-I set up a task force to develop a way for managers to better understand what drove their costs. This task force developed a cost management system based on what was then termed “activity accounting.” In 1988, CAM-I published their recommendations in a book titled *Cost Management for Today’s Advanced Manufacturing: The CAM-I Conceptual Design*. The book received such wide attention that it “marked the beginning of the modern era of ABC” (Player and Cobble, 1999, p. 24).

In 1989, John Miller advanced the approach by developing and teaching an ABM training course. The term “ABM” came into prominence when CAM-I published a glossary of business-related terminology in 1991. (Player and Cobble, 1999)

In the midst of the American business revolution that started in the early 1990’s, academics, consultants, and practitioners began to publish books, studies, and journal articles that moved beyond the costing tool, ABC, to discussion of the tool’s value in making business decisions, ABM (e.g., Brimson, 1991; Noreen, 1991; Turney, 1991; Clark and Baxter, 1992; Cooper et al., 1992). By 1992, the proliferation of training courses and software packages that taught and tested ABCM gave the “new” cost management system the momentum to “expand from a finance tool to a management weapon” (Player and Cobble, 1999).

C. ACTIVITY BASED COST MANAGEMENT RESEARCH EMPHASIS

Most ABCM research literature falls into two categories: (1) various works, primarily prescriptive books for use by practitioners, explaining how to implement ABCM (e.g., Forrest, 1996; Brimson and Antos, 1999), a few describing in-depth empirical field-studies of mostly private-sector organizations (e.g., Cooper et al., 1992;

Player and Cobble, 1999; Shields and Young, 1989), and (2) empirical articles in the management accounting literature presenting the results of mail and telephone surveys or interviews (e.g., Shields, 1995; McGowan and Klammer, 1997). The focus of the former has been to describe what value organizations can gain from implementing ABCM and how to go about doing it. A few seek to determine what value organizations have found in using ABCM, what lessons they learned in implementation, and how the same value can be derived in other organizations. The focus of the latter has been to provide theoretically informed analyses of ABCM and its implementation, including implementation trends across a wide array of organizations. Shields (1995) exemplifies this category of journal articles. Using a survey method with 143 organizations, he attempted to determine the relative impact of behavioral and organizational versus technical aspects of ABCM implementations on the relative success of those implementations.

Shields' survey demonstrates the utility of obtaining input data from a large sample of organizations with ABCM implementation experience. The survey was based on 17 factors Shields identified for the research, which he categorized as (1) technical implementation variables and (2) behavioral and organizational variables. Through analysis of the survey results, Shields found that six factors are associated with ABCM success defined as receiving financial benefit from ABCM. They were:

- top management support
- linkage to competitive strategies (other business reengineering initiatives)
- linkage to performance evaluation and compensation
- training in implementing ABC
- nonaccounting ownership (line managers viewed ABCM implementation as their program own, not simply the accountants' job), and
- adequate resources (Shields, 1995, p. 163).

Shields does not explicitly distinguish behavioral and organizational factors, referring to these six factors collectively as “behavioral and organizational factors” (p. 159). Shields also found that behavioral and organizational factors “explained a significant portion of the variation in ABC success, while the technical implementation variables did not” (p. 163). Shields’ technical implementation variables included (1) external consultants, (2) a stand-alone system for implementing ABCM, (3) canned software, and (4) custom software. Also, in describing the results of eight case studies performed by Cooper, et al. in 1992, Shields identifies additional evidence of the positive impact of behavioral and organizational factors:

The most successful implementations occurred when specific target individuals [people specifically designated to participate in the implementation] were identified in the early stages of the ABC project, and there was a sponsor who was a member of top management. (Shields, 1995, p. 151)

Additional literature supports Shields’ (1995) findings concerning the relevance of behavioral and organizational factors (Cooper, et al.’ 1992; Swenson, 1995; Kehoe, et al., 1995; McGowan and Klammer, 1997; Foster and Swenson, 1997; Player and Cobble, 1999; Ezzamel, Wilmott, and Worthington, 1999). Two works that explicitly treat government organizations are Player and Cobble (1999) and Kehoe, et al. (1995). In 1999, Player and Cobble published *Cornerstones of Decision Making: Profiles of Enterprise ABM*, which includes 14 international case studies on enterprise-wide ABCM implementation. One chapter describes the ABCM implementation in the British Royal Navy, including lessons learned. This chapter stressed the importance of properly analyzing the issues to be resolved, top management support, consistency in

implementation across the organization, simple ABCM models, proper training at all levels, and ongoing support for the implementation.

The second work, *Activity-Based Management in Government*, (Kehoe, et al., 1995) published by the consulting firm Coopers & Lybrand, is predominantly prescriptive and based on the collective ABCM implementation experiences of the authors and their customers. The authors distinguish between technical and behavioral barriers that affect implementation of any process reengineering effort; however, they do not distinguish categories for the 15 aids to implementation listed. For barriers to implementation, Kehoe et al. (1995) identify four behavioral barriers: management style and organizational culture, resistance, fear of new things, and fear of loss. They also specify three technical barriers to ABCM implementation efforts: the requirement that all decisions to change costs or to invest in process improvements be made using traditional cost systems, the absence of information systems to use in process improvements, and the halting of implementation efforts because external auditors did not understand ABCM. Since only one page in their chapter on change management is devoted to technical barriers, the effort the authors put into the behavioral barriers relative to technical barriers indicates the authors might support Shields' finding that behavioral factors are more relevant to determining ABCM success than technical factors.

This research seeks to expand the reader's understanding of the role various aspects of organizations play in determining the resulting success in ABCM implementation. Specifically, to aid military leaders in their ABCM implementation efforts, this research attempts to determine the factors that lead to varying degrees of success in implementing ABCM in a government organization.

However, the first challenge is to establish criteria for determining if an ABCM implementation is successful. This is presented in the next section.

D. DETERMINATION OF SUCCESSFUL IMPLEMENTATION

Defining ABCM success has proven to be somewhat elusive. For instance, Shields (1995) describes the problem facing researchers in determining success in ABCM implementation. He states:

Providing a definition . . . was problematic as the literature is vague about what constitutes success, and discussions with ABC experts during construction of the survey did not result in consensus about a tangible definition (Shields, 1995, p. 153).

Shields (1995), by using a broad sample, put the definition of success in the hands of the survey respondents. From the responses, he was able to determine the respondents' view of ABCM success relative to a seven-point scale, which indicated a correlation between his six factors associated with success and receiving some financial benefit. However, Elnathan, Lin, and Young (1996) state: "Strictly focusing on financial performance measures often is too short-sighted as any significant change . . . will take time to become evident" (p. 52). Since interviews for this thesis research occurred while divisions were in the process of implementing changes planned in the ABCM implementation process, it was not possible to define success in terms of achieving some financial benefit or other longer term effects.

Others (e.g., Player and Cobble, 1999; Brimson and Antos, 1994) refer to success as meeting predetermined criteria for best practices or excellence. CAM-I Cost Management System interest group members indicate that a definitive measure of successful ABCM implementation for all organizations may not be possible, stating that different organizations have different purposes for seeking to implement ABCM.

This leaves the problem of defining success unresolved. Therefore, in this research, the author describes each division's success in terms of its actions taken relative to an ABCM implementation model. The author's model, presented in the next section, combines ABCM models from the literature.

E. RESEARCH MODEL

The author reviewed ABCM and case study research literature to determine a proper approach to comparative case study research and to select an ABCM implementation model. The author used the model to devise interview questions and provide a basis for analyzing the divisions' ABCM efforts.

The CAM-I Cross [Appendix A], an ABCM model originally published by CAM-I in 1991 (Raffish and Turney, 1991), serves as the basis for understanding how ABCM works. It demonstrates visually how ABC and ABM center on the concept of activities (i.e. the actual work that is done). It does not, however lend itself well to describing the activities of implementing ABCM.

John Miller (1989) developed a model of ABCM implementation [Appendix B] that describes implementation in terms of progressive actions and lends itself to determining the degree to which the divisions implemented the mechanics of ABCM. Although this model provides sufficient detail to evaluate the steps of implementation from activity identification to tracing costs to product lines (i.e., ABC), it does not encompass the steps of ABM; thus the Miller model, alone, is insufficient for this research.

Player and Cobble (1999) developed what they call the "High Level Project Plan" [Appendix C] that provides a broader image of the progression of ABCM implementation

and covers the ABM aspects of implementation that Miller leaves out. In listing the steps involved in developing an ABM model, however, the High Level Project Plan does not present the degree of detail about ABC that is necessary for this research.

The model developed by the author for this research [Figure 1] inserts the Miller model into Player and Cobble's (1999) High Level Project Plan. It provides more comprehensive criteria for assessing the extent of each division's ABCM implementation. Wherever the language was manufacturing specific, the author inserted more general terminology.

1. Project Ramp-Up
 - a. Sell and Educate
 - b. Plan the Project
 - c. Train
2. Assess the Current Cost Environment, Select Time Frame and Collect Data
3. Develop the ABCM Model Conceptual Design
 - a. Specify Activities
 - b. Trace Costs to Each Activity
 - c. Determine Value-added vs. Non-value-added Costs
 - d. Determine Output Measures & Volumes
 - e. Select Appropriate Cost Drivers & Measures
 - f. Trace Costs to Cost Objects
4. Validate the Model
5. Report and Analyze the Results
6. Plan Improvements and Migration
7. Manage Improvement Projects

Figure 1. Comprehensive ABCM implementation model
Adapted from Appendix 1B of Player and Cobble (1999) and John Miller's Original ABC Training Course as cited in Player and Cobble (1999)

Project ramp-up (step 1) is the process of laying the foundation for the implementation. In the three ramp-up steps (steps 1a-1c), the organization's champion for the ABCM implementation gains support for the implementation by presenting potential benefits of ABCM and educating the organization's employees regarding the

differences between ABCM and traditional solutions to management problems. The body of employees now knowledgeable about ABCM develop a plan for implementation and train the managers, staff, and other employees in the mechanics of conducting ABC.

Assessing the current cost environment and collecting data (step 2) involves determining how (e.g., functionally, by processes, according to some regulation) and at what level (e.g., division, department, organization) the organization records costs and obtaining the cost data that will be needed to do step 3. In step 2, selecting a time frame is choosing the period to be "costed" in the model. The period chosen is typically the organization's fiscal year or cycle (Player and Cobble, 1999), although there are no upper or lower limits to the amount of time that can be used to describe the costs of activities. Developing separate models for each of multiple cycles is useful for comparison of costs between cycles.

Developing the ABCM model conceptual design (steps 3a-3f) consists of the mechanics of doing ABC. In the first step, participants in the ABCM implementation brainstorm to create a list of the activities they do in the conduct of work (e.g., entering data into a database, reviewing forms for accuracy, talking on the telephone with supervisors). The resulting list of activities is then grouped based on their similarities into a list of, say, five to 15 activities, which form the base for the rest of the implementation. The list of activities must be comprehensive so that all the costs of the organization, or sub-level, can be linked to activities.

Tracing costs to each activity (step 3b) takes the cost data collected and traces them directly to the activities that drive them. After employees have identified the activities that make up their workday, their salaries can be traced to activities. This step

often yields reactions of surprise when participants see the total costs of some lesser activities. (Cokins, et al., 1993)

Determining value-added versus non-value-added costs (step 3c) is exactly that – examining the activities to find costs that result from unnecessary, redundant, or excessive parts of processes or, possibly, whole activities. Activities or steps within activities are first analyzed from the perspective of what is internally non-value-added. Then, those activities or steps that are non-value-added within the specific branch, department, or organization are evaluated based on whether they are valuable to external stakeholders. When possible, assigning a percentage of total activity costs to the non-value-added steps, activities, or processes facilitates determining the savings that would be achieved by eliminating them.

Determining output measures and volumes (step 3d) describes the process of selecting relevant measures of an organization's output (e.g., specific products, services, customers, reports) and the volume during the period selected for the model in step 2.

In step 3e, selecting appropriate cost drivers and measures (e.g., need for quality, expediting shipments) involves determining those activities or conditions that are the root cause behind how much of an activity selected in step 3a gets done. The participants then determine the appropriate measures of those cost drivers.

Tracing costs to cost objects (step 3f), as opposed to allocating them, is the process of directly tracing the activity costs identified in step 3b to the cost objects selected in step 3d. The costs of these outputs then assist managers and employees by properly tracing overhead costs based on what is actually done in an organization and what causes it to be done.

Validating the model (step 4) requires that the participants that received the ABCM training and developed the model collaborate amongst themselves and with other employees to confirm if the costs traced to cost objects make sense and start building support, or "buy-in," for cutting out the steps or activities that create non-value-added costs. Here, participants adjust the model to reflect new or better information brought to light through model validation.

Participants can report and analyze the results (step 5) formally or informally, or both. Player and Cobble (1999) briefly describe ten different approaches to formal analysis of ABC data. These, and other formal approaches to ABCM reporting and analysis are not discussed in this research. Informal reporting and analysis may simply be determining that participants and other employees were taken aback during model validation by the cost per unit of some output and that they had some idea what the costs should be and how to lower them.

Planning improvements (step 6) includes identifying specific changes to remove non-value-added steps, processes, and activities, selecting new price models based on the new cost information, shifting people or work around, and/or using ABCM information to get approval for automation or other cost-saving measures that require up-front installation costs. Managing improvement projects (step 7) is taking appropriate action on the above plans and making them work.

In Chapter IV, the author uses collected data and the ABCM implementation model in Figure 1 to assess the relative performance of five divisions in a government bureau. Then, various implementation factors are identified to explain any variations in the degree of ABCM implementation among the divisions.

III. RESEARCH METHOD

A. RESEARCH SETTING

The organization in question is a government bureau within an agency of the Cabinet of the President of the United States. As discussed previously, the Bureau Chief wishes to maintain the Bureau's anonymity. The author may reveal, however, that the Bureau is a regulatory body that acts on behalf of the President in administering executive programs and congressional laws throughout the 48 contiguous states.

Five divisions within the Bureau, collectively termed the Directorate, attempted to implement ABCM. These five divisions, alone, fall under the management of one director, the Director in this research [Appendix D]. The divisions' headquarters are located in three major cities: three division offices in one city, with the other two in separate cities. For this research, the divisions are called Personnel Division, Administration Division, Information Systems Division, Financial Management Division and Audit Division.

The Directorate serves a support role for the rest of the Bureau and state governments and, in some cases, directly serves other agencies of the federal government. The divisions are divided along functional lines. Personnel Division handles human resources issues for the Bureau. Administration Division performs and manages a variety of centralized administrative functions and programs for the Bureau. Information Systems Division is comprised of a general information systems support team and two, more specialized support teams that offer expertise in managing automated data processing systems and network systems, respectively. Financial Management Division handles the Bureau's financial records, issues annual reports and financial

statements, and manages all the Bureau's external payment programs. Audit Division conducts financial and operational audits, both internal and external to the Bureau.

B. METHOD AND DATA COLLECTION

This research uses the comparative case study method, which is based on the underlying logic of theoretical replication: each case (i.e., division) may produce contrary results, but for predictable reasons. Treating the five divisions as separate cases, then, allows those divisions involved with the ABCM implementation to serve as a natural experiment for comparative case study analysis.

Two research techniques served to balance the comparative case study analysis. The author (1) conducted on-site interviews of at least two members of each division, and (2) obtained a copy of the ABC model each division developed with the single software package provided by the consultants hired by the Directorate to assist with the implementation. The ABC models provided by the division managers facilitated the research by providing a more objective basis for comparison of each division's performance to the ABCM implementation model presented in Chapter II.

Although four or more people from each division were part of the core team in the ABCM implementation, the author interviewed 13 of the employees most closely involved with the ABCM implementation: the Director, three individuals each from the Financial Management and Information Systems Divisions, and two individuals each from the Personnel, Administrative, and Audit Divisions. All interviewees were the division managers, managers within one division, or staff members within a division.

The on-site interviews were conducted face-to-face. Each interview was approximately two to three hours long, with one exception that lasted thirty minutes. The

interviews were conducted approximately ten months after the one-day training session held by the hired consultant that marked the start of the implementation process. Background information missed in the interviews was obtained via telephone calls.

The author asked the following questions during each interview:

- What success, if any, has [your] division had in implementing ABCM?
- What specific changes occurred as a result of implementing ABCM?
- What were the factors that aided [your] division in implementing ABCM?
- What were the factors that hindered [your] division in implementing ABCM?

These questions initiated discussion of the divisions' level of ABCM implementation and the factors that affected those efforts. Follow-on questions were contingent upon the responses of interviewees and were tailored to drive discussion back toward answering the initial questions or to delve into any factors interviewees initially raised and dismissed.

In Chapter IV, the author describes the events that led up to ABCM implementation in the Bureau, the divisions' implementation status at the time of the interviews, ranks the divisions according to their success in implementing ABCM, and identifies and analyzes the factors that affected ABCM implementation.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. RESEARCH DATA AND ANALYSIS

A. IMPLEMENTATION BACKGROUND

In 1995, Congress cut the Bureau's operating budget by one third. To cut costs, the Bureau reorganized through consolidation and reductions-in-force (RIF). Until 1995, Finance and Audit were the only divisions under the current Director. The Bureau created the Administration, Personnel, and Information Systems Divisions by removing and consolidating the support branches of the field offices. The restructuring placed all five financial and administration divisions under the Director and moved Administration, Personnel, and Information Systems Divisions into one building with the Director.

Since 1995, the Director has held off-site retreats at various locations throughout the nation to discuss ways to improve the Directorate. These retreats have served as the means to increase the Directorate's attention to overcoming the barriers to organizational change that characterized the Bureau prior to 1995.

In 1998, the Director learned of ABCM from a contractor working with the Directorate on an unrelated matter and began to "kick the idea around." As a result of discussions among the managers in the Directorate, a manager from Finance attended an ABCM training course at which he met, and spoke with, a consultant who described his company's "simple approach" to ABCM implementation.

The manager from Finance suggested discussing ABCM implementation at the next retreat, still two months away. The Director agreed and hired the consultant to introduce the process to division managers and present his company's fast-track approach to ABCM implementation.

Six weeks prior to the retreat, the consultant conducted a one-day training session for managers the Director had selected from each division and any staff members the divisions selected to attend. Each division was represented by five to ten individuals, including each division director, each division director's immediate subordinate managers, and divisional staff members selected by the division directors. The one-day training included an overview of ABCM, explanation of its benefits, and detailed training on how to develop an ABC model. The consultant also provided each division a software package that simplified the mechanics of doing the ABC portion and provided user-friendly guides embedded in each module of the program.

The managers and staff that attended the training returned to their divisions and, in the weeks before the retreat, met with members of their divisions to develop their ABC models, choose two activities in which to explore cost savings, and devise a plan to lower the activities' costs. These prototype models were taken to the retreat and the consultant spent two days training the same group that attended the one-day session to use and refine the models. On the final day of the retreat, the divisions that thought they could achieve the greatest savings, Personnel and Financial Management, presented their models and the benefits that could be gained from ABCM to the Bureau Chief. The Chief's response was, "Do this."

B. CURRENT STATUS OF ABCM IMPLEMENTATION

The following five sections provide a brief summary of the divisions' progress in implementing ABCM at the time of this research. Their progress is presented in comparison to the author's ABCM model in Figure 1. Wherever the divisions' models do not, or cannot, indicate completion of a step, the author relied on interviewees'

statements to determine if the step was completed. In Section D, the author relates the relevant events, issues and factors that explain the divisions' varied progress in implementation.

All five divisions have completed the steps of the implementation model from project ramp-up (step 1) through tracing costs to activities (step 3b). The actions of the Director and the consultant enabled the participants in all five divisions to complete each of the three stages of project ramp-up (steps 1a-1c) for the group of managers and division directors that attended the retreat. The divisions assessed their cost environment and collected data (step 2) and developed their ABCM model conceptual designs by tracing costs to each activity (step 3b) in their preparations for the May retreat. Beyond tracing costs to activities, however, the divisions vary in their progress with implementation.

1. Personnel Division

The Personnel Division (Personnel) has completed all steps of the ABCM model from project ramp-up (step 1) through project management (step 7). Although there is no indication in the division's ABCM model that Personnel determined value-added versus non-value-added costs (step 3c), the changes made in the division indicate non-value-added costs were identified informally. Specific changes interviewees identified were (1) removing non-value-added steps from its process of classifying position descriptions and (2) replacing a high-cost, internal, data-entry process with an automated data-entry process that uses web-based, customer data-entry forms. Although the cost savings have not yet been determined, these actions cut a three-week process down to two days, which employees in Personnel expect will lead to significant savings.

2. Administration Division

The Administration Division (Admin) has implemented ABCM through tracing costs to cost objects (step 3f), the final stage of the ABC aspect of ABCM, except that there was no indication in Admin's model that the division identified non-value-added costs (step 3c). Although Admin identified output volumes (step 3d), there is no indication in the model of the output measures – what the volume measures describe.

3. Information Systems Division

The Information Systems Division (IS) has performed ABCM implementation through tracing costs to each activity (step 3b) for each of three division branches. The three branches determined output measures for each activity (step 3d); however, one of the division's branches indicates output volumes for two of fourteen activities, while the other two branches do not indicate volumes over which to compute activity costs per unit. There was no indication from the division's ABCM models or the interviews that IS sought to separate value-added from non-value-added activities or parts of activities.

4. Financial Management Division

The Financial Management Division (Finance) has implemented ABCM through project management (step 7). Although Finance's model does not indicate they identified non-value-added costs (step 3c), one interviewee stated the division identified non-value-added and redundant steps to be eliminated in the payment process. Finance conducted model validation (step 4) primarily to gain approval from the Bureau Chief to develop and implement a program that would allow the division to collect fees from external sources through an electronic data interchange program and, secondarily, to reduce what one interviewee called "a lot of extra review." From one interview, the author

determined that, at the time of this research, Finance had also removed three steps of internal review from the payment process.

5. Audit Division

The Audit Division (Audit) has implemented ABCM through managing improvement projects (step 7). Although Audit's model does not indicate that there are non-value-added costs in their activities, Audit employees identified non-value-added costs (step 3c) associated with one of the division's activities: issuing delinquency notices to organizations that fail to meet their obligations. Audit used ABC data to obtain approval to remove the field offices from the delinquency review process. Although Audit's changes had a significant impact on the cost of issuing delinquency notices, the changes implemented were in an Audit Division activity that had limited impact on the division's primary cost driver (i.e., salaries paid for conducting and traveling to audits).

C. RELATIVE SUCCESS

At the time of this research, Personnel, Finance, and Audit had reached the project management stage of implementation. Personnel and Finance progressed further to actually change activities within their primary work processes and, thus, affected their primary cost drivers. Audit division made changes to a subsidiary process that is not affected by the division's primary cost drivers.

Here success is presented relative to the steps of the implementation model and, where this measure of success is comparable between divisions, success is further defined in terms of achieving change to primary work processes. A division's success in using ABCM to affect primary work processes gives a better indication of a division's opportunities for impacting other significant costs incurred by the division.

The divisions' relative ranking, in order of increasing levels of implementation based on progress in the steps of the implementation model, is: IS, Admin, Audit, Finance, Personnel. See Figure 2 for a presentation of the divisions' progress relative to the implementation model.

D. DISCUSSION AND ANALYSIS

1. Personnel Division

Personnel handles most human resource actions for the Bureau, including: processing disciplinary and reward actions, classifying descriptions of work positions, matching applicants to jobs, and advising employees regarding their benefits. The division's work is primarily routine, involving multiple-step processes where various documents pass through and across several layers of the division for updates, editing, and approval.

The division managers have worked for the Director since the reorganization of the Bureau in 1995, which took place approximately three years prior to the ABCM implementation. One manager indicated that the Director and the division director generate trust through their leadership and said that the atmosphere of trust removed barriers to obtaining buy-in for the ABCM implementation. One interviewee mentioned that an atmosphere of cooperation was present in all meetings throughout the ABCM implementation. The interviewee indicated that the cuts in 1995 placed the Bureau in a position where managers and lower-level employees feared the division might be eliminated and consolidated into their parent agency if they did not find a way to continuously streamline their processes. The interviewee also described how the Director held no preconceptions of the results to be obtained through ABCM and indicated that he

	IS	Admin	Audit	Finance	Personnel
1. Project Ramp-Up	-	-	-	-	-
a. Sell and Educate	x	x	x	x	x
b. Plan the Project	x	x	x	x	x
c. Train	x	x	x	x	x
2. Assess the Current Cost Environment, Select Time Frame and Collect Data	x	x	x	x	x
3. Develop the ABCM Model Conceptual Design	-	-	-	-	-
a. Specify Activities	x	x	x	x	x
b. Trace Costs to Each Activity	x	x	x	x	x
c. Determine Value-added vs. Non-value-added Costs					
d. Determine Output Measures & Volumes	x*	x*	x	x	x
e. Select Appropriate Cost Drivers & Measures		x	x	x	x
f. Trace Costs to Cost Objects		x	x	x	x
4. Validate the Model			x	x	x
5. Report and Analyze the Results			x	x	x
6. Plan Improvements and Migration			x	x	x
7. Manage Improvement Projects			x	x	x
* indicates partial completion of step 3d in Admin and IS.					

Figure 2. ABCM implementation progress relative to the implementation model

presented ABCM in a non-threatening manner. Specifically, the interviewee mentioned that the Director said the purpose of implementing ABCM was not to find the best way to reduce the number of employees, but to determine how to better employ their people. Two other factors mentioned as aids to the implementation were the consultants' approach, which was described as "not anal, not a painful experience," and the help modules embedded in user-friendly ABCM software.

One interviewee indicated that hiring a contractor with an external view of the organization permitted participants in the implementation to voice their opinions without fear that critical comments would be held against them. The interviewee indicated that the resulting open discussion allowed real change to occur since participants could be blunt when presenting non-value-added steps in the division's work processes. Getting out of the office and away from work responsibilities was also touted as a major factor that contributed to the quality of participation during implementation and, thus, to the division's success.

According to one interviewee, the division managers gained a view of where they expended their funding using ABCM. During model validation, when the division managers, staff, and other employees discussed the activity costs, they felt the numbers were "not far off the mark." Their activity costs revealed that they were spending far too much on data entry. By reviewing each step of a 32-step data entry process, they determined that 17 steps could be eliminated, based solely on their value internal to the division.

Next, personnel broadened the scope of value-added activities to take into account those steps that, if removed, would seriously detract from customer service. This caused

the participants to place seven steps back into the value-added category, which took the list of 17 down to ten non-value-added steps. One interviewee indicated that three of the seven steps were retained because individuals within the division wanted to maintain their input or control over their part in the process.

One interviewee stated it took fortitude to make each of the cuts, but that the potential savings would be worth it. The same interviewee also stated that having numbers to show the activities' costs helped to remove bias from the decisions to eliminate steps and helped to prevent the discontent that would have resulted from the same changes without the support of activity cost data.

Prior to implementing ABCM, the division discussed automating the data-entry process so external customers could submit information online. Gaining support to automate was difficult until the data-entry cost was revealed through ABCM. One employee said, "[ABCM] showed us where we were spending our money; we're spending it on data-entry." Although Personnel did not determine the amount the division could save through automation, they indicated it would reduce to two days a process that often took up to three weeks to complete.

The interviewees said they could automate without losing sight of the customer. The managers said they wanted to maintain a customer focus by depending increasingly on automation and directing the division's work toward a more advisory role. The interviewees indicated that the savings ABCM enabled them to effect gave them the credence they needed to obtain approval on their request for the funds needed to automate.

Both interviewees commented that one of the factors that held their attention early in the implementation was that the process of identifying activities and assigning the time they spent at work to appropriate activities made them take a hard look at how they used their time. The perspective they gained on their work habits has helped them use their time more effectively.

2. Administration Division

Admin performs a variety of administrative functions including acquisition, printing, property and vehicle management, records management, safety and occupational health management, and managing telecommunications. Admin was one of the divisions placed under the Director in the 1995 reorganization. Admin was the division most affected by the reduction-in-force and consolidation of offices into one central office.

One interviewee said that it was important to get out of the office to conduct the training and develop the models. The interviewee also indicated that the software program the consultant provided made the process much simpler in practice than in concept; "[the program] puts the data in boxes and gives it back in nice, neat boxes to help the manager." Both interviewees indicated that the employees that attended the ABCM training came away recognizing that ABCM would help them understand where the excess overhead was going and where they should focus their efforts to eliminate the excess.

Several issues hindered the division's ABCM implementation. Admin's director indicated that the division "had not done much with" the ABCM data because the momentum gained during the training died in overwhelming day-to-day requirements; and employees who attended the ABCM training were pulled off the team to work on

other projects. The interviewee described four factors that created the work overload: (1) the division needs more solid leadership in key positions, (2) the down-sizing and consolidation placed too many requirements on the division, (3) the potential for fraud, waste, and abuse in administrative work creates an environment with excessive oversight and management control reviews, and (4) the organization has six major customers, both internal and external, that often compete for resources.

Interviewees' statements provide additional evidence of factors that may have inhibited ABCM implementation progress in Admin: (1) The division has the perception that the Bureau wants to cut the division's resources further or eliminate it. (2) Many of the employees who were impacted by the reorganization in 1995 were adamantly resistant to change. (3) Personnel cited specific legislation and regulations that direct how they operate, saying "this is how we've always done it;" they acted as if the ABCM implementation was another flash-in-the-pan program to be endured until its proponents ran out of steam. (4) Division staff members who attended the retreat were excited about the benefits they expected to get from ABCM, but they were not able to sway the momentum of the dissenters.

Some technical issues were not resolved during the ABCM implementation. One interviewee said that they were having difficulty defining output measures when the bulk of Admin's work consists of managing administrative programs (e.g., occupational safety and health). In addition, another interviewee stated that program costs for the central office that were generated by field activities could not be well defined for inclusion in the ABCM model. By way of explanation, one interviewee pointed to the problem of administrative programs staying separate in the minds of both central office and field

activity personnel despite the 1995 consolidation. The same interviewee spoke of resolving the problem through programming and education, but the work overload and inability to obtain funding to support the necessary improvements prevented progress at the time of this research.

3. Information Systems Division

IS maintains the local area and wide area networks and intranets, including support for the field activities, develops proprietary software applications for the Bureau, purchases all hardware and software for the Bureau headquarters, conducts software training, maintains information systems security, and provides technical support for all desktop, network and automated data processing systems. In addition, for the year entered into the ABCM model, IS established and executed the Y2K program for the Bureau.

IS was one of the divisions consolidated during the 1995 reorganization. According to one interviewee, most of the Bureau's young, energetic, information systems talent was eliminated through reductions-in-force. He said that (1) the division still must meet the same level of service provided prior to the reorganization, (2) much of the division's work is unanticipated, and (3) the degree of specialization required to maintain the Bureau's information systems, coupled with the loss of young talent during the RIF, significantly impedes the division's ability to shift the skill mix around the Bureau to handle the division's responsibilities.

One interviewee said that there was not a lot of incentive to save. IS interviewees indicated that, by saving thousands of dollars in one year, their budget would be cut by that amount for the following year. One interviewee said IS would like to save money,

but if the division shows savings, the next year they might not have the funding they need to meet requirements. The interviewee also indicated that the division's budget was far less stable year-to-year than divisions with "ongoing operations." The interviewee explained that the IS's work is predominantly project-oriented and that this orientation led to unpredictability in funding requirements. In order to meet all requirements, IS has contracted out some of its services, such as the wide area network maintenance. Another interviewee mentioned that contract prices were rising, exacerbating the problems mentioned above.

According to the interviewees, two other events hindered the ABCM implementation in IS: The first event was response to the threat of the Y2K bug. It absorbed a large portion of the division's resources, time, and focus in the year of the ABCM implementation. The division's Y2K program was the second most expensive activity for the year. For IS, this threat overshadowed the need to focus time and resources on ABCM. One interviewee presented the Y2K problem as a further explanation of the division's reluctance to show costs. Although funds exceeding IS's budget were available to the division upon request, one interviewee indicated "it doesn't benefit to ask for new money for Y2K because it gets micro-managed." The interviewee stated that the extra funding to combat the Y2K bug was not worth the hassles of accounting for it.

The second event that impacted the ABCM implementation was an audit of the division by the Inspector General (IG), which occurred following the retreat. One interviewee said that the division was so wrapped up in meeting the requirements of the inspection that it was difficult to keep up with computer support requirements.

4. Financial Management Division

Finance maintains the Bureau's financial records, issues its annual reports and financial statements, and manages the accounts for cash, credit cards, grants, travel, and special funds. During 1999, the year recorded in the division's ABCM model, Finance also updated the code for their financial systems in preparation for Y2K.

The division managers have worked for the Director for about ten years. One interviewee said that he felt empowered by management, and that Finance employees could define their own work beyond the routine. In addition, he indicated that the division manager encouraged all division employees to develop long- and short-term strategic planning for both their work and personal lives.

Two interviewees from Finance stated that, before the ABCM implementation began, working with other parts of the Directorate was often frustrating, that the other four divisions gave little attention to streamlining their processes or managing their costs. One interviewee said that bringing in the consultant to present ABCM helped resolve much of Finance's frustration by presenting a nonconfrontational outsider's view of the organization. The same interviewee stated that the consultant helped the managers see implementing ABCM as a way to be competitive, a way to avoid being "gobbled up" by the Bureau's parent agency. The interviewee indicated that this threat pushed the managers to improve their divisions through "internal drive rather than policy."

One Finance interviewee indicated that looking back at what they did from an activity perspective helped them recognize the non-value-added and redundant tasks in the division's payment processes. The division eliminated these steps, and, although the interviewees were not able to state their expected cost savings from the action, they

argued that the savings in time would permit the division to pursue other activities that would add value to the payment process.

Two Finance interviewees said that the data revealed through ABCM gave the division the tangible support it needed to gain approval from the Bureau Chief for one of its proposals. The proposal included plans to develop and install an electronic data interchange (EDI) program that would significantly cut the cost of its fee collection activity. In addition, they stated that presenting the division's automation proposal at the retreat elevated attention to the program among the other four divisions. At the time of this research, the EDI program had not been developed.

5. Audit Division

Audit performs both internal and external oversight, although most of its work is with other entities that vary in size. Its audit work is primarily project-oriented; therefore, the variation in auditee size creates variation in the scope and expense of each project.

The division managers have a ten-year working relationship with the Director. One interviewee described the Director as "a pioneer . . . always looking for new tools for his divisions to use, and [without] heavy duty mandates." The Director had previously led the division through a reengineering process to move from paper to automation.

When an organization fails to meet its financial obligations to the government, Audit investigates the organization. Audit calls this tasking "non-discretionary work," which makes up about 35 per cent to 45 per cent of its annual workload. Since delinquency in paying obligations does not follow a consistent pattern, tasking for projects is unpredictable. In the words of one interviewee, "There is very little routine

work within [Audit] that would lend itself easily to ABCM." The hours members of the division spend traveling to or working at audit sites drive 90 per cent of the division's costs. Audit also receives variable tasking from other government organizations in addition to its internal requirements.

In a previous process improvement effort, reengineering work had revealed that automation (i.e., enhanced use of information technology) would save the division time and money. Field workers within the division built a management information system to track time on projects. The users became enthusiastic with its use and, by providing feedback on potential improvements and desired capabilities, caused the division to outsource expanding the capabilities of the program. One interviewee said that the time-tracking management information system was far more useful for the division than ABCM. He indicated that the only significant variable for his division was managing the time auditors spent in the field.

After determining activity costs for 1998 and 1999 through Audit's ABCM model, one interviewee stated that total expenses and total volume of work between the years were stable, but that the nature of the actual work that makes up the total volume is unstable. The interviewee also said that this instability caused changes in activity costs between 1998 and 1999 that "revealed little." When asked why, the interviewee stated it was the "nature of the work." Although Audit has some repetitive work processes, the scope and duration (and, therefore, the cost) of its most significant processes (i.e., auditing) vary widely between projects and years. The interviewee said that this limited the value of the activity costs uncovered through ABCM.

When combined with the effects of wide variations in non-discretionary work, one interviewee indicated that any budget based on activity costs from one year was meaningless for the next. The interviewee's explanation was that the cost of an audit was driven by the time required to conduct the audit, which was driven by the size of the organization audited. Since the division did not determine who it audited or when the audit occurred, the interviewee indicated that planning the cost of the year's audits would be arbitrary, at best.

The division was, however, able to effect change to one of its routine processes. Prior to the retreat, Audit had chosen to target the process of issuing delinquency notices to organizations that miss their quarterly obligations. When the division identified non-value-added activities during the implementation, the managers and staff determined that sending proposed delinquency notices through the field offices to be researched and sent back to Audit for issuance or cancellation created unnecessary redundancy in the process. Using ABC cost data, Audit obtained the Bureau Chief's approval to remove the field offices from the delinquency notice issuing and reviewing process. One interviewee stated that the division implemented the change approximately six months prior to the interviews. Audit had removed four steps from the delinquency review activity, cutting 45 days from the process and saving \$4,000 to \$5,000 per notice.

Another positive effect of the ABCM implementation mentioned by an interviewee was the response from employees when they learned of the costs of their activities. Employees that maintained the division's proprietary information systems were surprised at the high cost of maintenance. The interviewee said that the experience

caused many employees in the division to be more conscious of costs when performing their work.

E. IDENTIFICATION OF FACTORS AFFECTING IMPLEMENTATION

Various factors aided or hindered ABCM implementation in the Directorate. The following sections list the aids and hindrances identified through the interviews with the division managers and employees:

1. Factors That Aided ABCM Implementation

The author identified the following aids to ABCM implementation in the Directorate:

- Presence of a change agent in the Director's position
- Flat organizational structure
- Long term relationship with Director
- Routine work processes
- Perceived atmosphere of trust
- Perceived value of examining work processes
- Perceived savings (with automation)
- Perceived atmosphere of cooperation
- External pressure to cut costs
- Employee empowerment
- ABCM's purpose in the organization perceived as non-threatening
- Short implementation timeline and quick approach
- Consultant training and guidance
- User-friendly ABCM software
- Collaborative approach to making changes
- Training conducted away from work responsibilities
- ABCM's utility in gaining support for a new idea/program/solution
- Perception that ABCM will tell managers where the money goes
- Employees with financial background
- ABCM viewed as competitive tool
- Success with previous reengineering attempts

2. Factors That Hindered ABCM Implementation

The author identified the following hindrances to ABCM implementation in the Directorate:

- Lack of predictability or uniformity in project-oriented work
- Lack of control over tasking
- Suspicion of division management's intent
- Desire to maintain control
- Skipping any step in the implementation process
- "Just another program" syndrome
- Employees overwhelmed by day-to-day requirements
- Trained ABCM agents pulled off to work on other projects
- Difficulty defining output measures
- Difficulty separating local and central costs
- Fear of micro-management
- Fluctuating budget requirements
- Perception that any savings will shrink resources in following year
- Lack of understanding how to apply the tool

F. ANALYSIS OF IDENTIFIED FACTORS

Following identification of the factors affecting ABCM implementation in the divisions, the author reviewed the ABCM models developed by each division and the interviewees' statements or inferences to determine which factors were present in each division. The author then listed the aids and hindrances in rows and aligned the divisions in columns from left to right in order of increasing success with ABCM implementation [Figure 3], permitting the author to indicate the presence or lack of each factor in the individual divisions. An "x" in the factor's row and within the division's column indicates the factor's presence in the division.

To facilitate analysis, the author then separated the identified factors into four sets of characteristics: (1) behavioral factors, (2) organizational factors, and (3) technical implementation factors, and (4) work technology factors [Figure 4]. Categories

	Divisions in order of increasing success						
	Lower	IS	Admin	Audit	Finance	Personnel	Higher
Aids to ABCM implementation							
Presence of a change agent in the Director's position		x	x	x	x	x	
Flat organizational structure		x	x	x	x	x	
Long term relationship with Director				x	x		
Routine work processes					x	x	
Perceived atmosphere of trust				x	x	x	
Perceived value of examining work processes			x	x	x	x	
Perceived savings (with automation)					x	x	
Perceived atmosphere of cooperation						x	
External pressure to cut costs			x		x	x	
Employee empowerment				x	x	x	
ABCM's purpose in the organization perceived as non-threatening				x	x	x	
Short implementation timeline and quick approach		x	x	x	x	x	
Consultant training and guidance		x	x	x	x	x	
User-friendly ABCM software		x	x	x	x	x	
Collaborative approach to making changes				x		x	
Training conducted away from work responsibilities		x	x	x	x	x	
ABCM's utility in gaining support for a new idea/program/solution					x	x	
Perception that ABCM will tell managers where the money goes			x		x	x	
Employees with financial background				x	x		
ABCM viewed as competitive tool					x	x	
Success with previous reengineering attempts				x			
Hindrances to ABCM implementation							
Lack of predictability or uniformity in project-oriented work		x	x	x			
Lack of control over tasking		x		x			
Suspicion of division management's intent			x				
Desire to maintain control						x	
Skipping any step in the implementation process		x	x				
"Just another program" syndrome			x				
Employees overwhelmed by day-to-day requirements			x				
Trained ABCM agents pulled off to work on other projects			x				
Difficulty defining output measures			x				
Difficulty separating local and central costs			x				
Fear of micro-management		x					
Fluctuating budget requirements		x					
Perception that any savings will shrink resources in following year		x					
Lack of understanding how to apply the tool		x	x				

Figure 3. ABCM implementation factors identified

	Lower	Divisions in order of increasing success					Higher
		IS	Admin	Audit	Finance	Personnel	
Work Technology Factors							
Aids							
Routine work processes					x	x	
Hindrances							
Difficulty separating local and central costs			x				
Difficulty defining output measures			x				
Employees overwhelmed by day-to-day requirements			x				
Lack of control over tasking	x	x		x			
Lack of predictability or uniformity in project-oriented work	x		x	x			
Fluctuating budget requirements	x						
Behavioral Factors							
Aids							
Perceived atmosphere of cooperation						x	
Perceived atmosphere of trust				x	x	x	
Employee empowerment				x	x	x	
ABCM's purpose in the organization perceived as non-threatening				x	x	x	
Collaborative approach to making changes				x		x	
Training conducted away from work responsibilities	x	x		x	x	x	
Long term relationship with Director				x	x		
Hindrances							
Desire to maintain control						x	
"Just another program" syndrome			x				
Suspicion of division management's intent			x				
Lack of understanding how to apply the tool	x	x					
Perception that any savings will shrink resources in following year	x						
Fear of micro-management	x						
Organizational Factors							
Aids							
Perceived savings (with automation)					x	x	
ABCM's utility in gaining support for a new idea/program/solution					x	x	
ABCM viewed as competitive tool					x	x	
Perception that ABCM will tell managers where the money goes			x		x	x	
External pressure to cut costs			x		x	x	
Flat organizational structure	x	x		x	x	x	
Presence of a change agent in the Director's position	x	x		x	x	x	
Success with previous reengineering attempts				x			
Hindrances							
Trained ABCM agents pulled off to work on other projects			x				
Technical Implementation Factors							
Aids							
Perceived value of examining work processes			x	x	x	x	
Consultant training and guidance	x	x		x	x	x	
User-friendly ABCM software	x	x		x	x	x	
Short implementation timeline and quick approach	x	x		x	x	x	
Employees with financial background				x	x		
Hindrances							
Skipping any step in the implementation process	x	x					

Figure 4. Aids and hindrances sorted by category, prevalence, and dispersion

one and two are based on categories defined in ABCM research by Shields (1995) and concepts from organizational theory presented by Daft (1998). The third category reflects Shields' technical implementation variables, those factors distinctive to ABCM implementation. Using Daft's (1998) definition of technology as the nature of tasks (i.e., routine, non-routine, craft, engineering), the author created a separate category for work technology factors (i.e., those factors associated with task technology), not present in Shields' (1995). This fourth category had not been identified in the ABCM research literature.

After categorizing the factors, the author organized the aids and hindrances under each category [Figure 4]. Within the groups of aids, the author ordered the factors from highest to lowest degree of impact in ABCM implementation. For example, the factor "perceived atmosphere of cooperation" is listed at the top of the list of aids in the behavioral factors category since it was present only in Personnel, the division with the most successful implementation. Conversely, hindrances are listed in order from lowest to highest degree of impact. For example, the factor "fluctuating budget requirements" is listed at the bottom of the hindrances in the work technology factors category since it was present only in IS, the division with the least successful implementation. Ordering the factors in this way facilitates determining which factors had the most influence on each division's ABCM implementation.

Where factors were identified as prevalent (i.e., present in four or more divisions) or dispersed among three divisions nonconsecutively (i.e., present in three or more divisions, but not the three most or least successful divisions), the factors' prevalence or

dispersion indicate they cannot explain the variations in implementation among the five divisions.

The factors designated too prevalent to aid analysis include:

Work Technology Factors

- None

Behavioral Factors

- Training conducted away from work responsibilities

Organizational Factors

- Flat organizational structure
- Presence of a change agent in the Director's position

Technical Implementation Factors

- Perceived value of examining work processes
- Consultant training and guidance
- User-friendly ABCM software
- Short implementation timeline and quick approach

The factors designated too dispersed to aid analysis include:

Work Technology Factors

- None

Behavioral Factors

- None

Organizational Factors

- Perception that ABCM will tell managers where the money goes
- External pressure to cut costs

Technical Implementation Factors

- None

To facilitate analysis, the categories are presented in the order above from this point forward.

It should be noted that these aids may be worth seeking and the hindrances worth avoiding in the implementation of ABCM. But, their presence does not assist the author's analysis of the effects of the four categories of factors on the divisions' varied success in ABCM implementation.

Some aids and hindrances were present in only one or two divisions and not in the divisions at the extremes. As such, these factors, of which there are four, also cannot be included as determinants of ABCM implementation success.

First, since the most successful division, Personnel, worked with the Director for a short time, relative to Admin and Finance, an extended working relationship between the Director and division management does not appear to be a significant driver of success.

Second, the same pattern follows for employees' financial background, indicating that education or experience with cost management, although an aid to ABCM implementation, is not a dominant driver of implementation success.

Third, in this research, success with previous reengineering attempts does not appear to be a significant success factor, since the factor was only identified as present in Audit division, third in order of level of implementation.

Fourth, when Personnel took advantage of an opportunity to eliminate steps in the job classification process, employees' desire to maintain control over their part of the process prevented the division from streamlining the process as much as desired. This hindrance did not, however, significantly affect the division's success, nor was it an issue in the other four divisions, indicating that employee desire to maintain control of a process was not a dominant hindrance to success.

In Figure 5, the author removed from Figure 4 the factors that, by virtue of their prevalence (presence in four or more divisions), dispersion (presence in three divisions, non-consecutively), or lack of significant impact (described above), do not appear to be driving aids or hindrances to ABCM implementation. Figure 5 shows the aids that clearly relate to ABCM success in the Directorate and the hindrances that relate to lesser success or incomplete implementation.

The following discussion presents observations based on the author's analysis of the categories and factors in Figure 5. The analysis is described by category and based on the interview data as it elaborates the significant determinants of the division's level of ABCM implementation.

A clear relationship between work technology and implementation success is evident from the analysis of aids and hindrances. To explain, in the two most successful divisions, routine work processes aided the implementation; however, in the other three divisions, lack of predictability or uniformity of project-oriented work processes and lack of control over tasking were mentioned by interviewees in each division as a major hindrance to their ABCM implementation.

The split between the work technology aids and hindrances occurs between Audit and Finance columns. (1) Routine work processes aided Personnel and Finance. Audit used ABCM information to change the routine process of issuing delinquency notices; however, this process is not a primary driver of the division's costs. Also, Audit's change was in a subsidiary process that was not typical of the dominantly non-routine work done by that division. (2) Non-routine work processes characterize Admin, IS, and Audit's primary work technology and hindered these divisions' ABCM implementations.

	Lower	Divisions in order of increasing success					Higher
		IS	Admin	Audit	Finance	Personnel	
Work Technology Factors							
Aids							
Routine work processes					x	x	
Hindrances							
Difficulty separating local and central costs			x				
Difficulty defining output measures			x				
Employees overwhelmed by day-to-day requirements			x				
Lack of control over tasking		x	x	x			
Lack of predictability or uniformity in project-oriented work		x	x	x			
Fluctuating budget requirements		x					
Behavioral Factors							
Aids							
Perceived atmosphere of cooperation						x	
Perceived atmosphere of trust				x	x	x	
Employee empowerment				x	x	x	
ABCM's purpose in the organization perceived as non-threatening				x	x	x	
Collaborative approach to making changes				x		x	
Hindrances							
"Just another program" syndrome			x				
Suspicion of division management's intent			x				
Lack of understanding how to apply the tool		x	x				
Perception that any savings will shrink resources in following year		x					
Fear of micro-management		x					
Organizational Factors							
Aids							
Perceived savings (with automation)					x	x	
ABCM's utility in gaining support for a new idea/program/solution					x	x	
ABCM viewed as competitive tool					x	x	
Hindrances							
Trained ABCM agents pulled off to work on other projects			x				
Technical Implementation Factors							
Aids							
None listed							
Hindrances							
Skipping any step in the implementation process		x	x				

Figure 5. Relationship of aids and hindrances by category

For Audit's primary work technology, project-oriented audits, the challenge of applying ABCM to the work was exacerbated by lack of control over tasking. In Admin, lack of control over tasking and overwhelmed employees added to the difficulty of applying ABCM to their project-oriented work. For IS, the work technology challenges were evident in fluctuating budget requirements and lack of control over tasking.

Among the behavioral factors affecting ABCM implementation, the aids and hindrances present opposing viewpoints regarding the perceived atmosphere of cooperation and trust, the level of employee empowerment, and the manner in and purpose for which ABCM is presented and perceived. This opposition is apparent in Figure 5 as a split between the behavioral aids and hindrances that occurs between the Admin and Audit columns. For example, contrast fear of micro-management in IS and suspicion of division management's intent in Admin with the atmosphere of trust and employee empowerment present in the Personnel, Finance, and Audit.

The three factors that are consistent aids among the three most successful divisions are (1) employees' perceived atmosphere of trust, (2) employee empowerment, and (3) ABCM's purpose in the organization being perceived as non-threatening. The contribution of a collaborative approach to making changes seems predictive, although not consistent, since it was not apparent in Finance.

The hindrances - (1) fear of micro-management, (2) perception that any savings will shrink resources in the following year, and (3) lack of understanding how to apply the tool - were determinants in IS's lesser success. Although not present in IS, interviews with Admin personnel confirm that the division's behavioral hindrances were determinants of Admin's lesser degree of success. These hindrances included (1)

suspicion of division management's intent, (2) the "just another program" syndrome, and (3) lack of understanding how to apply the tool.

Among the organizational factors affecting ABCM implementation, the aids can be observed in Finance and Personnel's use of ABCM. Only these two divisions employed ABCM as a competitive tool to determine concrete cost measures, which helped them obtain approval to fund process automation that would lead to savings. Personnel and Finance did so by gaining approval for automating data entry processes, Personnel in classifying position descriptions and Finance in handling payments. Interviews with Admin personnel indicated employees overwhelmed with day-to-day requirements drove the organizational hindrance that affected Admin's success (i.e., trained ABCM agents pulled off to work on other projects).

In the technical implementation category, all aiding factors were eliminated in creating the relationship list in Figure 5 due to their prevalence or lack of significant impact as described above. Although skipping any step in the implementation process appears as a hindrance under technical implementation hindrances, the interviews revealed that this hindrance is driven by hindrances in the other three categories. To illustrate, interviewees in Admin indicated they were unable to devote resources to the ABCM implementation after trained ABCM agents were pulled off the implementation to work on other projects (organizational factor). Other contributors were suspicion of division management's intent and the "just another program" syndrome (behavioral factors) that afflicted some of Admin's employees. Since Admin did not conduct model validation, the division was unable to go much beyond ABC.

V. CONCLUSIONS, DISCUSSION OF FINDINGS AND RECOMMENDATIONS

This chapter discusses the author's conclusions drawn from the preceding analysis. The conclusions are organized by the four categories of factors that were evaluated in terms of their impact on ABCM implementation. Next, the author describes his observations of the secondary benefits of ABCM implementation. Also included in the chapter, are the author's recommendations for leaders in the Department of Defense, and specifically the Department of the Navy, who are implementing or considering implementation of ABCM. In addition, the author recommends areas for further research.

A. CONCLUSIONS

1. Work Technology Factors

Conclusion 1: Routine work processes tend to drive ABCM implementations toward success while non-routine work processes may limit the potential success of ABCM.

Explanation: In the Directorate, there was a direct relationship between routine work processes and greater success in implementing ABCM. There was also a direct relationship between non-routine, project-oriented work processes and limited success, leading to this conclusion.

Conclusion 2: Work technology hindrances can overcome positive behavioral factors in affecting ABCM implementation success.

Explanation: In Audit, the only division with behavioral aids (e.g., atmosphere of cooperation, employee empowerment) and work technology hindrances (e.g., lack of control over tasking, lack of predictability or uniformity of project-oriented work). The

conclusion drawn is that the positive behavioral aids were overcome by the work technology hindrances, thus preventing the division from effecting any change in the primary, project-driven processes that dominate the work done in the division or acquiring funding for process automation.

This is not to say that ABCM is incompatible with project-oriented work processes, but that such work processes add a level of complexity to ABCM implementation that is difficult to overcome. Audit responded to the challenge by working on one routine process within the division. This success and data from other divisions suggest that, when work is as varied and unpredictable as the project work of Audit, it is difficult to identify standard processes. In order for ABCM to work, it is necessary to subdivide activities based on their scope and develop an ABCM model at a lower level than project-like activities. For example, Audit could have developed a model for its auditing function by breaking the auditing activity down into sub-activities that follow a routine pattern.

Conclusion 3: Complex combinations of work technology hindrances tend to limit ABCM implementation success.

Explanation: Since the divisions that were less successful in ABCM implementation faced additional work technology hindrances (including lack of control over tasking, fluctuating budget requirements, and employees overwhelmed with work), the author concludes that more complex combinations of work technology hindrances tend to lead away from success.

Regarding the three conclusions above, the literature reviewed is silent on the subject of work technology as it relates to ABCM implementation. This research

contributes to the literature by identifying the need for further research to address the issue of work technology's impact on ABCM implementation.

2. Behavioral Factors

Conclusion 4: Behavioral factors impact an organization's success, or lack of success, when implementing ABCM.

Explanation: The relationship between the behavioral aids and hindrances and the resulting degree of success in ABCM implementation indicates that behavioral factors impact the success of the ABCM implementation, supporting the findings of Shields (1995) and McGowan and Klammer (1997).

Specifically, the following behavioral conditions appear to facilitate the ABCM implementation: (1) employees perceive that they work in an atmosphere of trust and cooperation, (2) employees perceive that they are empowered, (3) employees perceive that ABCM's purpose does not threaten their job security, resources, or autonomy, and (4) employees perceive that the changes made through ABCM will be decided through collaboration.

This conclusion confirms the finding by McGowan and Klammer (1996) that behavioral factors significantly impact the success of ABCM implementations. Also, as mentioned in Chapter II, Shields (1995) found that six factors drove ABCM success in 143 firms. They were (1) top management support, (2) linkage to competitive strategies (other business reengineering initiatives), (3) linkage to performance evaluation and compensation, (4) training in implementing ABC, (5) nonaccounting ownership (line managers viewed ABCM implementation as their own' program, not simply the accountants' job), and (6) adequate resources. The first, top management support, is not

directly addressed by this research except to say that the factor was present in the form of the Director and the Bureau Chief. Since all five divisions worked for these two individuals, top management support, alone, did not drive success.

Shields' (1995) findings (2) through (4) and (6) will be discussed in the next section. The fifth factor, nonaccounting ownership, was present in Personnel's ABCM implementation, confirming Shields' finding and statements of the like from Player and Cobble (1999) and Cooper, et al. (1992).

Further confirmation of the literature lies in the impact of fear expressed in the least successful division, where fear took the forms of fear of micro-management and fear that any savings will lead to decreased resources in following years. This confirms statements by Kehoe, et al. (1995) describing fear as a major barrier to implementing ABCM.

3. Organizational Factors

Conclusion 5: Understanding both the internal and external benefits of ABCM facilitates successful ABCM implementation. ABCM provides internal organizational benefits by offering evidence that fosters support for organizational changes and external benefits through improving efficiency.

Explanation: The relationship between the organizational aids (i.e., perceived savings with automation, ABCM's utility in gaining support for a new idea/program/solution, and ABCM viewed as a competitive tool) and success in ABCM implementation lead the author to the conclusion that a factor in driving an ABCM implementation toward success is having managers and subordinates who understand what bargaining and competitive power ABCM provides them and the nature of

organizational changes (e.g., automation, removing steps in a process) they will uncover through implementing ABCM.

This confirms findings by Player and Cobble (1999) and Bhimani and Pigott (1992), as well as statements by Kehoe, et al. (1995) that leaders of organizations must know what they expect to get from implementing ABCM in order to gain from it.

This research supports the relevance of three of Shields' (1995) organizational success factors (i.e., the second, fourth and sixth success factors). Shields' (1995) second success factor, linkage to competitive strategies (i.e., other business reengineering initiatives) was present in the Directorate only in that the Director sought whatever business tools were available to keep the Directorate focused on the concept of change. Shields' fourth factor, training in implementing ABC, was true for all five divisions, regardless of the degree of ABCM implementation. This indicates that good training, alone, cannot ensure ABCM success. Adequacy of resources, Shields' (1995) sixth success factor was important in explaining the hindrances experienced in Admin where employees were overwhelmed with other work and thus not an available resource. The impact of Admin's human resource constraint also confirms findings by Cooper, et al., concerning the importance of continuity among participants during ABCM implementation.

Regarding Shields' third success factor, linking ABCM implementation to performance evaluation and compensation, there was no evidence in this research of a relationship between ABCM implementation and performance evaluation and compensation. This indicates the factor may not be necessary for success, given sufficient other motivation exists.

4. Technical Implementation Factors

Conclusion 6: Technical implementation factors, in comparison to other factors, do not contribute significantly to success or failure in ABCM implementation.

Explanation: The author eliminated technical ABCM implementation aids from the list of factors driving success due to their prevalence (presence in four or more divisions) or insignificance (the most successful division, Personnel, did not have employees with a financial background as an aiding factor). Also, as mentioned in the analysis of technical factors, the technical ABCM implementation hindrances were driven by hindrances in the other categories. Since all technical implementation factors were prevalent among the divisions, insignificant in their contribution to implementation success, or driven by factors in other categories, the author concludes that technical implementation factors are not the most significant determinants of successful ABCM implementation. This supports the findings of Shields (1995) and McGowan and Klammer (1997).

5. Additional Benefits Observed

Some factors did not prove exclusive enough to the more successful divisions to aid the analysis, but the author includes them due to the emphasis interviewees placed on them. The author made two observations not associated directly with factors affecting implementation. (1) Interviewees frequently spoke of the value they gained from recording how they spent their time at work and described it as a unique experience in gaining perspective on their work. (2) Interviewees in four divisions mentioned that employees became more cost conscious after seeing the costs of activities or activities traced to outputs.

From the first observation, the author concludes that an important aspect of ABCM is its value in causing employees to reflect on their work and how they spend their time, a process that helped some Bureau employees to become more effective and efficient with their time. From the second observation, the author concludes that the difference in information presented by ABCM in contrast to traditional cost systems impacts participants' views on how the work they do creates costs. This confirms statements by Kehoe, et al. (1995) and Cokins, et al. (1992) regarding the way implementing ABCM positively affects people's thinking about how the activities they do and the time they spend doing those activities create costs.

B. RECOMMENDATIONS FOR DOD

This research offers leaders in the Department of Defense a framework to evaluate their command's readiness to implement ABCM. For commands that sought to implement ABCM and achieved limited success, it offers a framework to evaluate the reasons the implementation was limited and correct for the future.

The author recommends that leaders who choose to implement ABCM in their commands (1) review the list of factors in Figure 6, assessing the presence or status of each factor in the command, prior to commencing ABCM implementation. These leaders should (2) identify the factors over which they exercise control and those factors that are beyond their control. This done, commanders can then (3) focus on the time required to remedy problems that arise from the assessment. Finally, leaders should (4) prioritize the factors for which problems arise according to the time it will take to make a change and the difficulty they expect to face in bringing that change to bear.

	Factor Present	Can Control	Cannot Control	Long-term Effort	Priority
Work Technology Factors					
Aids					
Routine work processes					
Hindrances					
Difficulty separating local and central costs					
Difficulty defining output measures					
Employees overwhelmed by day-to-day requirements					
Lack of control over tasking					
Lack of predictability or uniformity in project-oriented work					
Fluctuating budget requirements					
Behavioral Factors					
Aids					
Perceived atmosphere of cooperation					
Perceived atmosphere of trust					
Employee empowerment					
ABCM's purpose in the organization perceived as non-threatening					
Collaborative approach to making changes					
Training conducted away from work responsibilities					
Hindrances					
"Just another program" syndrome					
Suspicion of division management's intent					
Lack of understanding how to apply the tool					
Perception that any savings will shrink resources in following year					
Fear of micro-management					
Organizational Factors					
Aids					
Perceived savings (with automation)					
ABCM's utility in gaining support for a new idea/program/solution					
ABCM viewed as competitive tool					
Flat organizational structure					
Presence of a change agent in the Director's position					
Hindrances					
Trained ABCM agents pulled off to work on other projects					
Technical Implementation Factors					
Aids					
Perceived value of examining work processes					
Consultant training and guidance					
User-friendly ABCM software					
Short implementation timeline and quick approach					
Hindrances					
Skipping any step in the implementation process					

Figure 6. ABCM implementation assessment chart

Leaders must recognize that work technology hindrances (i.e., lack of predictability or uniformity of project-oriented work, lack of control over tasking, fluctuating budget requirements, overtasked employees) may limit the potential success of ABCM. What's the solution? Find routine processes among the activities on which to focus streamlining efforts or break activities down into routine processes for the same purpose.

Understanding how to implement ABCM in an organization facing these challenges requires that leaders know what they want to accomplish through the implementation and what types of information it will provide them, and a clear assessment of readiness as determined by criteria outlined in Figure 6.

This research indicates that positive behavioral and organizational factors are not, in themselves, enough to overcome work technology challenges. However, this research also indicates that behavioral and organizational factors do impact success. Because it is important to complete each step of the implementation process, cooperation from employees is critical in developing ABCM conceptual models, conducting model validation, and implementing changes. ABCM information on output costs is only as good as the employees' input. Although perfect information is not necessary for ABCM to be useful for decision-making, good information is, and this depends on behavioral commitment to the implementation process.

C. RECOMMENDATIONS FOR FURTHER RESEARCH

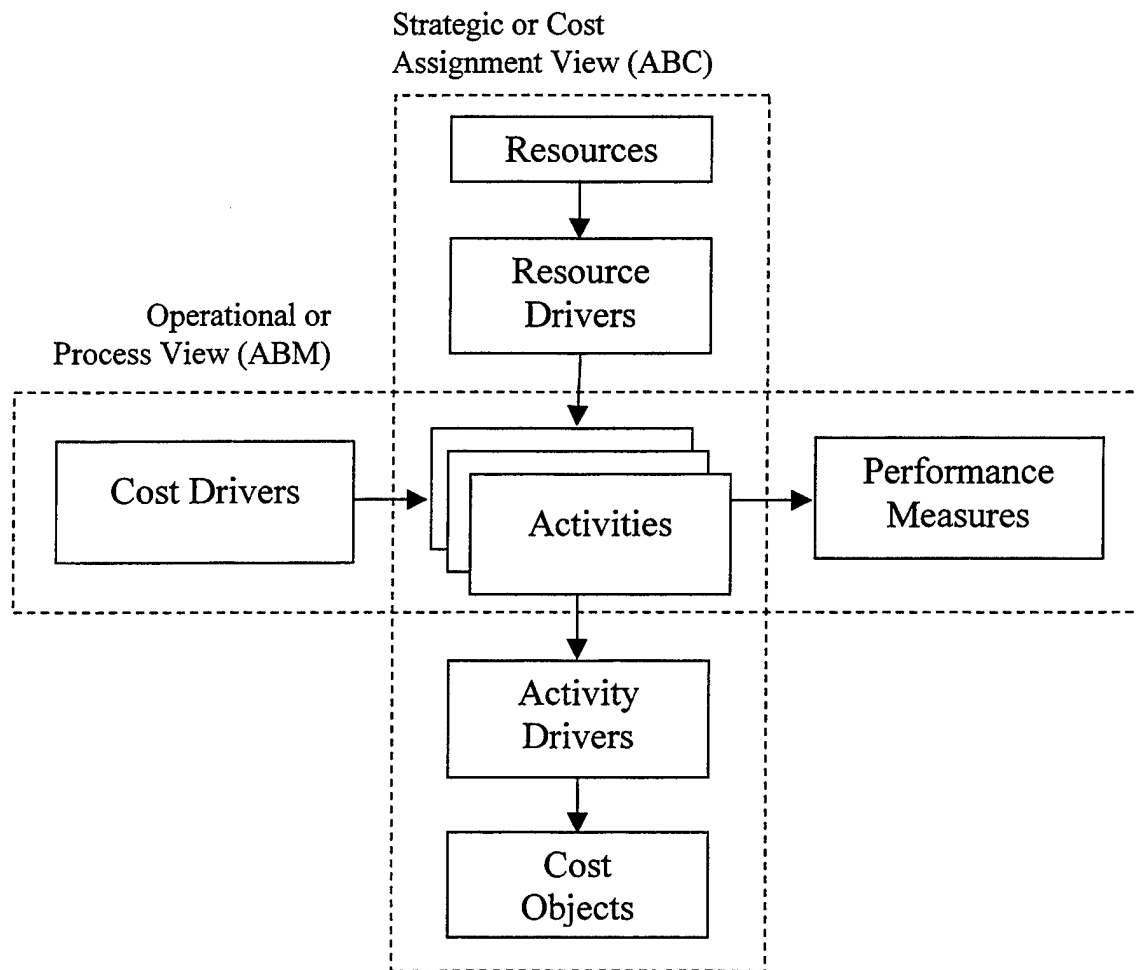
The author recommends the following areas for further research:

- Further examination of the relationship between work technology (i.e., routine versus nonroutine tasks) and ABCM implementation is required to confirm the findings presented by this research.
- Compare work technology versus behavioral factors as dominant drivers in a variety of organizations.
- Since some factors were eliminated from the analysis in this research due to their prevalence among the divisions, investigate success in ABCM implementation across a variety of organizations when those factors are absent to determine if they are unnecessary or necessary but not sufficient.
- Investigate interdivisional or intra-agency workflow and interdependence as a factor affecting success. This research found preliminary evidence of the role of task technology within a division on the success of ABCM implementation but did not delve into interdivisional or intra-agency workflow and relationships. Extensive detail would be necessary to provide adequate analysis of the impact of varied forms, task complexity and task interdependence (e.g., pooled, sequential, reciprocal) on ABCM implementation.
- Submit a survey to all Directorate ABCM participants formed from the list of factors in Figure 4. Request the respondents rank the factors according to their impact, if any, on the division's implementation of ABCM, including a place for them to add factors not listed. Provide sufficient detail in describing each factor to limit the impact of miscommunication between the researcher and the respondents on the survey data. Use

statistical approaches, such as multiple regression analysis to develop a prioritized list of the most significant factors in determining ABCM implementation success.

THIS PAGE INTENTIONALLY LEFT BLANK

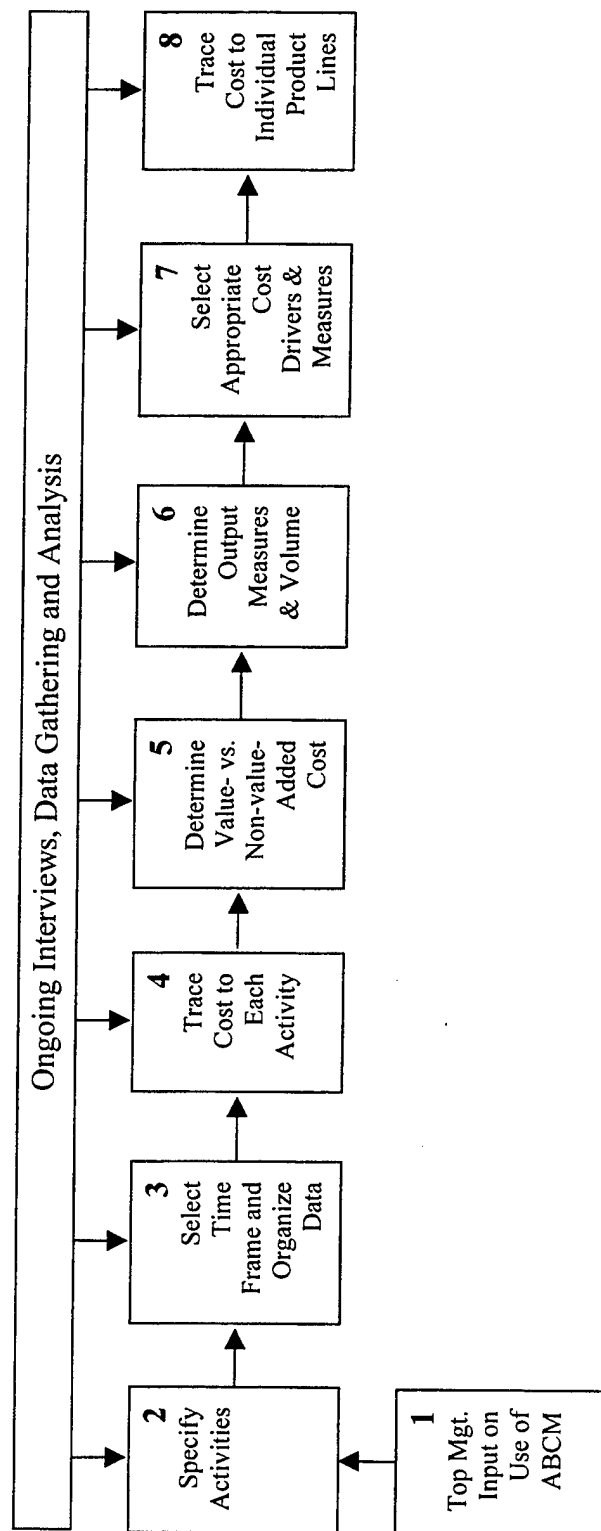
APPENDIX A. THE CAM-I CROSS



Source: Raffish and Turney (1991)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX B. STEPS TO CREATE AN ABM MODEL



Source: Miller (1989)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C. HIGH LEVEL PROJECT PLAN

High Level Project Plan		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11
Project Step												
1. Project Ramp-Up Selling and Education Project Planning Training												
2. Assessment of Current Cost Environment and Collect Data												
3. ABM Model(s) Conceptual Design												
4. Configure Prototype & Implement ABM Model(s)												
5. Model(s) Validation												
6. Reporting and Analysis												
7. Improvement/Migration Planning												
8. Project Management												

Source: Player and Cobble (1999)

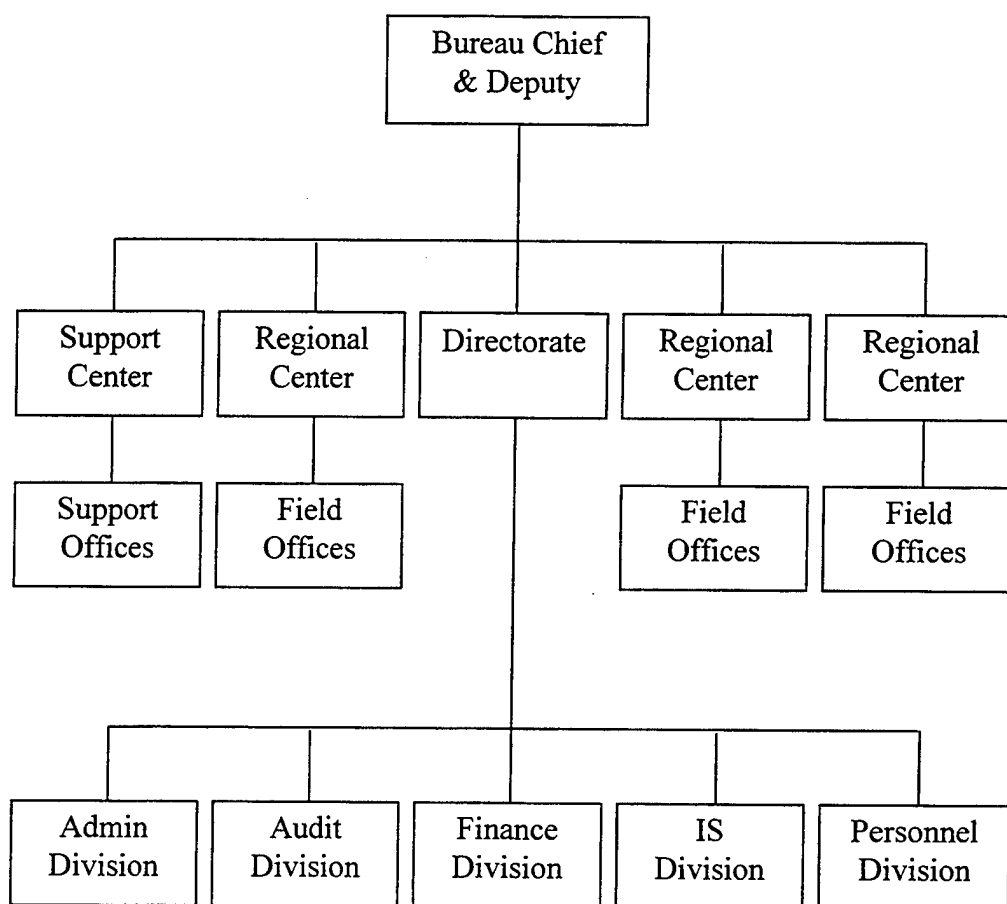
APPENDIX C. HIGH LEVEL PROJECT PLAN (CONTINUED)

High Level Project Plan		Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24
Project Step 1														
Project Step 2														
Project Step 3														
Project Step 4														
Project Step 5														
Project Step 6														
Project Step 7														
Project Step 8														

Source: Player and Cobble (1999)

APPENDIX D. BUREAU ORGANIZATION CHART

This organization chart is adapted from the official organization chart of the Bureau. The actual source organization is, therefore, not listed.



THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Anderson, S.W., Hesford, J., and Young, S.M., "Factors influencing the performance of activity based costing development teams: A field study of ABC model development time in the automobile industry," paper presented at the Accounting, Organizations and Society Conference on Accounting, Organizational Transformation and New Organizational Forms, Los Angeles, California, 6 November 1999.
- Arnold, P., "Reform's changing role," *Public Administration Review*, September, 1995.
- Beckhard, R., and Harris, R.T., *Organizational Transitions: Managing Complex Change* (2nd ed.). Addison-Wesley, 1987.
- Berliner, C., and Brimson, J.A., Eds., *Cost Management for Today's Advanced Manufacturing*, Harvard, 1988.
- Bhimani, A. and Pigott, D., "Implementing ABC: a case study of organizational and behavioral consequences," *Management Accounting Research*, Vol. 3, 1992.
- Brimson, J.A., *Activity Accounting: An Activity-Based Costing Approach*, John Wiley & Sons, 1991.
- Brimson, J., and Antos, J., *Activity-Based Management for Service Industries, Government Entities, and Nonprofit Organizations*, John Wiley & Sons, 1994.
- ____ and _____, *Driving Value Using Activity-Based Budgeting*, John Wiley & Sons, 1999.
- Clark, A., and Baxter, A., "ABC + ABM = Action: Let's Get Down to Business," *Management Accounting (UK)*, June, 1992.
- Cokins, G., Stratton, A., and Helbling, J., *An ABC Manager's Primer*, McGraw-Hill, 1992.
- Congress of the United States of America, *Chief Financial Officers Act of 1990*, <<http://www.npr.gov/library/misc/cfo.html>>, 23 January 1990, Accessed: 13 May 2000.
- _____, *Bill Summary and Status for the 103rd Congress: Government Performance and Results Act*, Public Law: 103-62, 3 August 1993.
- Cooper, R., and others, *Implementing Activity-Based Cost Management: Moving from Analysis to Action*, Inst. of Management Accountants, 1992.
- Daft, R., *Organization Theory and Design* (6th ed.), South-western, 1998.

- Drucker, P., *The Practice of Management*, Harper & Row, 1954.
- Elnathan, D., Lin, T., and Young, S., "Benchmarking and Management Accounting: A Framework for Research," *Journal of Management Accounting Research*, Vol. 8, 1996.
- Ezzamel, M., Willmott, H., and Worthington, F., "Accounting, Organizational Transformation and Work Organization," paper presented at the Accounting, Organizations and Society Conference on Accounting, Organizational Transformation and New Organizational Forms, Los Angeles, California, 6 November 1999.
- Foster, G. and Swenson, D., "Measuring the success of activity-based cost management and its determinants," *Journal of Management Accounting Research*, Vol. 9, 1997.
- General Accounting Office, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, GAO/GGD-96-118, 1 June 1996.
- Hultin, J., Under Secretary of the Navy memorandum to Under Secretary of Defense (A,T & L), dtd 8 December, 1999.
- Kehoe, J., and others, *Activity Based Management in Government*, Coopers & Lybrand, 1995.
- McGowan, A., and Klammer, T., "Satisfaction with Activity-Based Cost Management Implementation," *Journal of Management Accounting Research*, Vol. 9, 1997.
- Miller, J., "ABC Training Course," APQC, 1989.
- Noreen, E., "Conditions Under Which Activity-Based Cost Systems Provide Relevant Costs," *Journal of Management Accounting Research*, Vol. 3, Fall 1991.
- Player, S., and Cobble, C., *Cornerstones of Decision Making: Profiles of Enterprise ABM*, Oakhill Press, 1999.
- Raffish, N., & Turney, P., Eds., *The CAM-I Glossary of Activity-Based Management*. Version 2.1, CAM-I, 1991.
- Shields, M., "An Empirical Analysis of Firms' Implementation Experiences with Activity-Based Costing," *Journal of Management Accounting Research*, Vol. 7, Fall 1995.
- _____, and Young, S., "A Behavioral Model for Implementing Cost Management Systems," *Journal of Cost Management*, Winter 1989.

Swenson, D., "The benefits of Activity-Based Cost Management to the Manufacturing Industry," *Journal of Management Accounting Research*, Vol. 7, Fall 1995.

Turney, P., "How Activity-Based Costing Helps Reduce Cost," *Journal of Cost Management*, Vol. 4, No. 4, Winter 1991.

White, T.S., *The 60 Minute ABC Book*, CAM-I, 1996.

Wood, P., "How to Spend \$100,000," *Reinvention Express*, Vol. 2, No. 17, 3 July, 1996.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center2
8725 John J. Kingman Road, Suite 0944
Fort Belvoir, VA 22060-6218

2. Dudley Knox Library2
Naval Postgraduate School
411 Dyer Road
Monterey, California 93943-5101

3. Professor Kenneth J. Euske, Code SM/EE1
Department of Systems Management
Naval Postgraduate School
Monterey, CA 93943

4. Assistant Professor Susan Hocevar, Code SM/HC1
Department of Systems Management
Naval Postgraduate School
Monterey, CA 93943

5. RADM Joseph W. Dyer AD001
Commander, Naval Air Warfare Center, Aircraft Division
22347 Cedar Point Road
Unit 6
Patuxent River, MD 20670-1161

6. Mr. Ron Runion1
Naval Air Warfare Center, Aircraft Division
Code 7.6, Comptroller Department
Patuxent River, MD 20670-5304

7. Mrs. Patricia Robrecht1
Naval Air Warfare Center Aircraft Division
Code 7.6, Comptroller Department
Patuxent River, MD 20670-5304

8. Mr. G. Richard Reed FMB41
Assistant Secretary of the Navy (Financial Management and Comptroller)
1000 Pentagon
Washington, D.C. 20375-1000

9. Mr. Dan Fink N432B1
Deputy, Navy Logistics Acquisition and Assessment Branch
Office of the Chief of Naval Operations (Logistics)
2211 Jefferson Davis Hwy
6th Floor, Suite 6600
Arlington, VA 22242
10. CAPT John E. Muttu, USN (ret.), Code SM/MU1
Conrad Chair of Financial Management
Department of Systems Management
Naval Postgraduate School
Monterey, CA 93943
11. Mr. Mike Roberts1
MEVATEC Corporation
1308 Country Club Road
Georgetown, TX 78628
12. Miss Laura Zander1
MEVATEC Corporation
1525 Perimeter Parkway, Suite 500
Huntsville, AL 35806
13. LT Scott W. Gray, USN3
27867 Chapel Court
Mechanicsville, MD 20659